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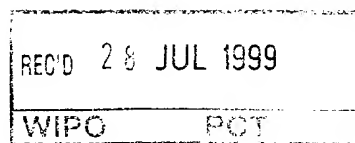
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Ny dansk patentansøgning

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A method and a system for processing postal items

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A METHOD AND A SYSTEM FOR PROCESSING POSTAL ITEMS

Technical field

The present invention relates to a method and a system for processing postal items at an item processing installation such as, e.g., a postal terminal. In particular, the present invention relates to a system and a method comprising a sorting conveyor and a Optical Character Recognition (OCR) system combined with a video coding (VC) system for automatic or semiautomatic capturing of a printed or written address block provided on a postal item. The present invention relies on an OCR system and a VC system known *per se* from the prior art.

Background of the invention

The volume of mail sent world wide has been continuously growing for the past decades, and different measures have been developed in order to handle the growing volume of mail. In particular, methods relying on automatic means for reading addresses provided on postal items have been developed. One means of automated mail processing used today relies on optical character recognition (OCR). The OCR is capable of scanning an address block on an envelope and processing it so as to derive a machine-readable alphabetic or numeric code. Furthermore, systems relying on cameras, such as CCD cameras have been developed for automatically capturing and processing an image of an address provided on a postal item.

As an alternative to such systems, system relying on pre-printed envelopes being provided with a bar code of phosphorescent ink encoding that allows machines to automatically read address information off the envelope without the need for camera or OCR-systems. Such systems have, however, not led to a significant improvement of the efficiency in handling postal items since only a small

fraction of the total number of envelopes are or have been provided with such a bar code.

In the prior art different methods for automatic mail processing have been suggested. EP 0 424 728 B1 discloses a
5 method for deferred processing of OCR scanned mail. The method relies on OCR and image scanning techniques coupled with knowledge based operator-assisted disambiguation and validation of the address data.

EP 0 606 124 A1 discloses a method for sorting objects
10 according to destination. The objects are placed on a transport system and supplied to various destination stations, in which the objects are delivered in accordance with the address indication. The address indications are detected by means of one or more cameras near the supply end
15 of a transport system.

WO 97/49503 discloses a method of processing postal matters in an automatic address-reading system. The system comprises a first address evaluation system and a video coding system. In case the first address evaluation system fails to capture
20 and evaluate and image of the address of a postal item, the item is passed to the video coding system.

Further related system are known from EP 0 589 119 A1, US 4,992,649, EP 0 635 314 A1, EP 0 584 607 A2 and US 5,697,504.

The invention disclosed herein address the problem of
25 performing with reliability an improved automatic sorting and distributing of postal items.

Summary of the invention

It is therefore an object of the invention to provide an improved technique for processing OCR-scanned postal items or
30 postal items whose address block has been captured by means other than OCR-scanning. It is another object of the

invention to provide an improved method for multi-stage processing of postal items, in particular to provide an improved method for such processing in case different mail processing installations are arranged with long distances therebetween. It is a further object of the invention to provide a system which is capable of automatically handling different sized postal items, including as well envelopes as parcels. It is a still further object of the invention to provide an improved method for automatically processing postal items originating from entities sending a relatively large number of postal items, such as, e.g., corporate entities.

Thus, according to a first aspect, the present invention provides a method for processing postal items, each item being sent from a departure location to a destination location, the method comprising:

(a) delivering items to an item receiving part of a first item processing installation, the first installation being adapted to collect and process items from a plurality of departure locations and comprising one or more first control systems for controlling the processing of items,

(b) conveying each item along a first system for optically capturing a first image of a printed or written address block optionally provided on the items,

(c) processing the first image to derive first address data,

(d) passing the first address data to a first computer system comprised in the at least one first control system,

(d_{ii}) processing the first address data of an item in order to determine whether or not it is sufficient in order to automatically sort and distribute the item in question, and
- if the first address data is sufficient: going to step (e),

- if the first address data is insufficient: going to step (f),

- (e) comparing the first address data to second address data previously stored in a first database comprised in or
5 connected to the first computer system, and
- if the first address data of an item is identical or nearly identical to an entry of second address data in the first database: associating a unique address identification code the item in question and going to
10 step (g),
 - if the first address data of an item is not identical or nearly identical to any entry of second address data in the first database: associating an error code to the item in question and going to step (g) or
15 transporting the item in question to further manual or automatic processing thereof,
-

(f) conveying the items along a second system for optically capturing a second image of the address block, and

- processing the second image to derive third address
20 data,
- ensuring by automatic or manual means that the third address data is sufficient in order to automatically sort and distribute the item in question,
- storing the third address data as the first address
25 data and going to step (e),

- (g) conveying each item along a sorting conveyor adapted to sort items, the sorting conveyor comprising a plurality of discharge stations and means for unloading items being conveyed along the sorting conveyor, discharging of items
30 being controlled by the first computer system,

(h) discharging each item at a discharge station, the discharge station being automatically selected by the first computer system according to the unique address identification code or according to the error code,

- 5 (j) optionally transporting the items for further processing thereof or delivery thereof at the respective destinations.

An advantage of the method according to the invention is that it may be easily combined with existing sorter conveyor systems due to the compatibility of the system with existing
10 control systems of conveyors which may be installed at mail processing installations or plants. A further advantage of the method according to the invention is that it provides the possibility of performing full-automatic processing of postal items. A still further advantage is that an item processed
15 only passes through a scanning device during its complete processing from the departure location to the destination location.

In the present context, the terms "control system" should be understood as a system comprising one or more processors
20 comprised, e.g., in one or more computer systems and storage means such as, e.g., one or more databases. Accordingly, the databases and computer systems mentioned herein are comprised in the control systems mentioned, unless otherwise specified. The computer systems and/or databases mentioned may be
25 comprised in one than more control system. The term "database", "database system" or "database unit" should be understood as a computer system or other suitable system for storing and processing data. Thus, the databases, database systems and database units comprise processing means, unless
30 otherwise specified.

Though all the process steps (a)-(j) specified above are considered essential to the present invention, some of the steps may be bypassed under certain circumstances as specified below.

The first image may be captured while the item in question is being conveyed along the sorting conveyor. The sorting conveyor may be any kind of suitable conveyor, such as, e.g., a tilt tray conveyor or a cross-belt conveyor known *per se* from the prior art. The second image may be captured while the item in question is being conveyed along the sorting conveyor and is preferably captured by a video coding system.

The second image may be captured by a human, the information provided by the second image being passed to the first computer system by manually entering the information. A combination of a human capturing the second image and the video coding system capturing the image may be provided. Thus, some of the data provided by the address block may be captured by the video coding system and some of the data may be captured by the human. Other means for capturing the second image may be provided, such as a CCD camera or an OCR system.

Preferably, step (e) further comprises performing spelling checking at least part of the first address data so that misspelled address information may be automatically corrected.

According to a further aspect, the present invention provides a method for processing postal items, each item being sent from a departure location to a destination location, the method comprising:

(a) providing an item with an optically readable identification code in a standard format at the departure location, the identification code corresponding to a unique address identification code stored at a storage means comprised in a computer system comprised in or connected to a first control system comprised in a first item processing installation,

(b) delivering items to an item receiving part of the first installation, the first installation being adapted to collect and process items from a plurality of departure locations and comprising one or more first control systems for controlling
5 the processing of items,

(c) passing the identification code together with a destination code of the item from the departure location to at least one of the one or more first control systems, the destination code identifying the address of the destination
10 location of the item,

(d) storing the destination code in the storage means and processing the destination code so as to associate the destination code to the corresponding unique address identification code,

15 (e) scanning the optically readable identification code at the item processing installation by means of a code scanning device adapted to pass the identification code to at least one of the one or more first control systems,

(f) processing the identification code so as to associate the
20 corresponding unique address identification code to the item,

(g) conveying each item along a sorting conveyor adapted to sort items, the sorting conveyor comprising a plurality of discharge stations and means for unloading items being conveyed along the sorting conveyor, discharging of items
25 being controlled by a first computer system comprised in the one or more first control systems,

(h) discharging each item at a discharge station, the discharge station being automatically selected by the first computer system according to the identification code
30 associated to the item in question,

(j) optionally transporting the items for further processing thereof or delivery thereof at the respective destinations.

The features cited in the connection with the second aspect of the present invention may be and are preferably the same
5 features as cited in connection with the first aspect of the present invention.

A particular advantage of a method according to the second aspect of the invention is that it combines the benefits of providing items with a pre-printed or pre-written standard
10 code, such as a bar code, and the benefits of known OCR-systems or other systems for automatic capturing of address blocks.

The method may further comprise, prior to or during step (e),
~~the step of determining whether the identification code is~~
15 present on the item and in such case whether it is readable by the code scanning device. The method according to the second aspect may further comprise the step of processing the item in question by a method according to the first aspect of the invention in case step (e) or (f) of the method according
20 to the second aspect fails or in case the identification code is not present or unreadable, the first item processing installation of the method according to the first aspect being the first item processing installation of the method according to the second aspect.

25 The identification code may be scanned while the item in question is being conveyed along the sorting conveyor. Preferably, the identification code is being scanned by means of the same device as the device by means of which an image of the address block is being captured, i.e., preferably by
30 the OCR-device or the OCR-system.

The features described in the following applies to the first as well as the second aspect of the present invention.

The method may further comprise the step of weighing at least some of the items being processed at the first installation. Preferably, items are weighed by means of an electronic weight operationally connected to one or more of the control systems. Thus, the method according to the invention may further comprise the step of passing weight information representing the weight of the item in question to a computer system comprised in the at least one first control system. Furthermore, the method may comprise the step of automatically measuring or scanning the volume of at least some of the items being processed at the first installation, the measuring or scanning being performed by means of a volume scanning system. A volume scanning system known *per se* from the prior art is preferably provided for scanning or measuring volume of items. The measuring or scanning may be performed on the sorting conveyor while the item in question is being conveyed along the sorting conveyor. The volume scanning system may be operationally connected to the one or more control systems, so as to allow for volume information representing the volume of the item in question to be passed to a computer system comprised in the at least one first control system.

The method may further comprise, subsequent to step (j), transporting a plurality of items from the first installation to a second item processing installation, the second item processing installation being adapted to further process the items. Whereas the first item processing installation is typically a main mail center, such as, e.g., the main mail center of a city, a district or an airport, the second item processing installation is typically a main center or a post office of a city or a region. The processing of items at the second mail processing installation may be the final processing, and the items may be delivered directly to their respective destination locations from the second mail processing installation. Alternatively, from the second installation, items may be transported to one or more further item processing installations optionally provided. The items

may be delivered to their respective destinations by courier service or by mail delivery service.

The unique address identification code preferably represents or contains at least the city or local district, street name and the street number of the destination location, and the unique address identification code may further represent the country of the destination location. The unique address identification code may further represent or contain other information, such as data related to sortation patterns, sortation sequences and/or information about a given discharge station assigned or associated to the item in question for use during the further processing of the item. The unique address identification code may further represent the name of the addressee.

15 ~~The method may further comprise, subsequent to step (c) of the method according to the second aspect of the invention, comparing the destination code and/or the unique address identification code to second address data previously stored in a first database comprised in or connected to the one or~~
20 ~~more first control systems in order to verify the destination location of an item. This may include that, if a change of address of an addressee of an item in question has been recorded in the control system, the unique address identification code which is assigned or associated to the~~
25 ~~item in question represents the updated address of the addressee. The method may further comprise that the address provided on the item is compared to the unique address identification code assigned to the item, e.g. at the discharge stations of the sorting conveyor. The method may~~
30 ~~further comprise that an address label is printed on attached to an item if, e.g., a change of address of an addressee has been recorded. The method may also comprise that, if an item has been discharged at a wrong discharge station or is believed to have been discharged at a wrong discharge~~
35 ~~station, the item in question is returned to the address~~

capturing system and that steps (b)-(j) are repeated, or that an address label is printed and attached to the item.

In the method according to the invention, the one or more first control systems comprised in the first installation are
5 connected to an exterior database in which names and address of a large number of persons is stored, the method further comprising:

- automatically associating the unique address
identification code corresponding to the modified second
10 address data to an item in case the first address data or the destination code correspond to the non-modified second address data.

The postal items may be any kind of items, including mail items, such as envelopes or parcels, and the first and second
15 systems for optically capturing an image of the address block may comprise auto focusing systems.

The method may further comprise, prior to step (g), bypassing all or some of steps (b)-(j) in case the weight and/or the dimensions of a postal item exceeds previously determined
20 limits. Weight and/or volume beyond the previously determined limits may be determined either automatically or manually. Furthermore, information indicating volume and/or weight of items may be passed from a sender of an item to the one or more control systems.

25 The method may further comprise, subsequent to step (j), transporting at least some of the items to a second item processing installation for further processing of the items. The second mail processing installation may, e.g., be an installation of the above-mentioned type. The second item
30 processing installation may comprise a second control system for controlling processing of items, the second control system being connected to the one or more first control systems, and the method may further comprising, subsequent to step (e) or (f) in a method according to the first aspect of

the invention or subsequent to step (c) in a method according to the second aspect of the invention:

(I) passing destination information, such as the unique address identification code, together with item

5 identification data from the first control system to the second control system, and

(II) providing each item with an optically readable item identification code.

Thus, data may be transferred between item processing
10 installations in a fast and efficient way, and items may be efficiently processed at the second item processing installation. As mentioned above, further item processing installations may be provided, and in such case, such further installations may be operatively interconnected.

15 The method may comprise capturing the optically readable item identification code at the second item processing installation and deriving therefrom the corresponding item identification data and destination information. Items may be further processed or sorted items according to the respective
20 destination information. The method may further comprise passing a table comprising item identification information and destination information associated to a plurality of items from the one or more first controls systems to the second control system or from the second control system to a
25 third control system comprised in a third item processing installation optionally provided. The method may comprise, at the second or the third control system, processing the destination information assigned or associated to each item, so as to derive the address of the destination location form
30 the destination information.

The method may further comprise printing the table and/or a list of addresses of destination locations of items and delivering the items associated to the item identification information listed or stored in the table at the respective
35 destination locations of the items, so as to facilitate distributing of items, in case the items are not

automatically transported to their respective destination locations.

In a method according to the invention, a plurality of second item processing installations may be provided. In such case, 5 step (I) as described above preferably comprises passing the destination information together with item identification data from the first control system to the respective second control systems in accordance with the destination information, whereby destination information and item 10 identification information associated to an item being transported to a certain second item processing installation is being passed to that second item processing installation. Thus, for a example, an item being transported from a main mail center, i.e. the first item processing installation, to 15 a city mail center, i.e. the second item processing installation, is followed by associated information needed at the second item installation for further sorting, distributing and/or other processing of the item.

In a method according to the invention, the step of capturing 20 the first image of a printed or written address block provided on items and/or the step of scanning the optically readable identification code may be carried out by means of an optical character recognition system which may comprise an automatic auto focusing facility.

25 The method may further comprise the step of passing data to an item tracking database connected to or comprised in the one or more first control systems, in the second and/or in the third control system when an item has been delivered at a destination location or at other events during the steps of 30 processing an item. The item tracking database may be used for tracking items during processing thereof or for tracking of lost items. It may further be used for automatic billing or invoicing of carriage costs.

The method may further comprise passing volume and/or weight data from the one or more first control systems to an account database connected to or comprised in an account computer system. The account computer system may be connected to or
5 comprised in the item tracking database, and in such case the method according to the invention may comprise automatically invoicing carriage costs by:

- computing the carriage costs in dependency of the weight and/or volume of an item and optionally in dependency of
10 one or more further factors,
- printing an invoice and sending it to a debtor and/or electronically forwarding the invoice to the debtor.

A plurality of item tracking databases and/or a plurality of account computer systems are preferably provided, and the
15 steps of passing data to/from the tracking databases and/or ~~the account computer systems may comprise passing the data to~~ a selected one of the plurality of item tracking databases and/or to a selected one of the plurality of account computer systems, respectively.

20 The method may further comprise generating a sortation sequence or sortation pattern in the one or more first control systems or in the second control system, the sortation sequence or sortation pattern comprising information as to the sequence of further sortation of a
25 plurality of items. The sortation sequence or sortation pattern may be used at the first and/or at the second item processing installation as well as in distributing of items and during final delivery of items at the respective destination locations. The sortation sequence or pattern is
30 preferably generated in the one or more first control systems, and the method may comprise passing the sortation sequence or sortation pattern from the one or more first control systems to the second control system or to another control system.

The method may further comprise generating sortation data or sortation information for a plurality of items at the departure location prior to step (b) in the method according to the second aspect of the invention and passing such data
5 or information to the one or more first control systems directly or through a sortation data generating computer system. Thus, a customer, such as, e.g., a corporate entity, has the opportunity to define the sortation sequence and/or the sortation pattern of items sent by him/her.

10 Information may be passed from the sortation generating computer system to the account computer system or to the tracking database or from the account computer system or from the tracking database to the sortation generating computer system. A plurality of sortation data generating computer
15 systems are preferably provided, and the method may comprise passing sortation data from the plurality of sortation data generating computer systems to the one or more first computer systems.

The account computer system(s), the sortation data generating
20 computer systems and/or of one or more other systems or database may be placed at a location different from the first and the second item processing installation. Thus, such systems may be placed at, e.g., corporate customers, or at parcel distributing entities owning or collaborating with the
25 entity running the first, second and/or other item processing installations.

According to a third aspect, the present invention relates to a system for processing postal items for carrying some or all
30 of the method steps described above. In particular, the third aspect of the invention relates to such a system, wherein each item is being sent from a departure location to a destination location, the system comprising:

- an item receiving part for receiving items at first item
35 processing installation, the first installation being adapted

to collect and process items from a plurality of departure locations and comprising one or more first control systems for controlling the processing of items,

5 - a first system for optically capturing a first image of a printed or written address block optionally provided on the items,

- means for processing the first image to derive first address data,

10 - means for passing the first address data to a first computer system comprised in the at least one first control system,

~~- processor means for processing the first address data of an item in order to determine whether or not it is sufficient in~~
15 question, order to automatically sort and distribute the item in

- processor means for comparing the first address data to second address data previously stored in a first database comprised in or connected to the first computer system, and

20 - means for associating a unique address identification code the item in question,

- means for an error code to the item in question,

- means for transporting the item in question to further manual or automatic processing of the item,

25 - means for conveying the items along a second system for optically capturing a second image of the address block, and

- processor means for processing the second image to derive third address data,
- means for ensuring by automatic or manual means that the third address data is sufficient in order to automatically sort and distribute the item in question,
- storage means for storing the third address data as the first address data,
- a sorting conveyor adapted to sort items, the sorting conveyor comprising a plurality of discharge stations and means for unloading items being conveyed along the sorting conveyor, discharging of items being controlled by the first computer system,
- a plurality of discharge stations arranged along the sorting conveyor, the discharge station being automatically selected by the first computer system according to the unique address identification code or according to the error code,
- optionally means for transporting the items for further processing thereof or delivery thereof at the respective destinations.

The system according to the third aspect of the invention may further comprise means for carrying out some or all of the method steps described above.

According to a fourth aspect, the present invention relates to a system for processing postal items, each item being sent from a departure location to a destination location, the system comprising:

- means for providing an item with an optically readable identification code in a standard format at the departure location, the identification code corresponding to a unique

address identification code stored at a first storage means comprised in a computer system comprised in or connected to a first control system comprised in a first item processing installation,

- 5 - delivering means for delivering items to an item receiving part of the first installation, the first installation being adapted to collect and process items from a plurality of departure locations and comprising one or more first control systems for controlling the processing of items,
 - 10 - means for passing the identification code together with a destination code of the item from the departure location to at least one of the one or more first control systems, the destination code identifying the address of the destination location of the item,
-
- 15 - second storage means for storing the destination code in the first storage means and processing the destination code so as to associate the destination code to the corresponding unique address identification code,
 - scanning means for scanning the optically readable
20 identification code at the item processing installation by means of a code scanning device adapted to pass the identification code to at least one of the one or more first control systems,
 - processing means for processing the identification code so
25 as to associate the corresponding unique address identification code to the item,
 - means for conveying each item along a sorting conveyor adapted to sort items, the sorting conveyor comprising a plurality of discharge stations and means for unloading items
30 being conveyed along the sorting conveyor, discharging of items being controlled by a first computer system comprised in the one or more first control systems,

- means for discharging each item at a discharge station, the discharge station being automatically selected by the first computer system according to the identification code associated to the item in question,

- 5 (j) optionally means for transporting the items for further processing thereof or delivery thereof at the respective destinations.

The system according to the fourth aspect of the invention may further comprise means for carrying out some or all of
10 the method steps described above.

Brief description of the drawings

Fig. 1 is a diagrammatic illustration of a preferred embodiment of a OCR/VC system according to the invention and the interfaces between computer systems comprised in the
15 OCR/VC system according to the invention,

Fig. 2 is a system overview diagrammatically illustrating the computer systems comprised in the system according to the present invention,

Fig. 3 is a diagrammatic illustration of a sortation
20 database and computer system comprised in a preferred embodiment of the system according to the invention,

Fig. 4 is a diagrammatic illustration of the interfaces to a sortation database system comprised in the preferred embodiment of the system according to the invention,

25 Fig. 5 is a diagrammatic illustration of the interfaces to a sortation database unit comprised in the preferred embodiment of the system according to the invention,

Fig. 6 is a diagrammatic illustration of an automatic sortation system comprised in the preferred embodiment of the
30 system according to the invention,

Fig. 7 is a diagrammatic illustration of the function of sorting tables,

Fig. 8 is a flow sheet illustration of a part of the information flow in a system according to the present invention,

Fig. 9 is a flow sheet illustration an encoding
5 procedure,

Fig. 10 is a diagrammatic illustration of interface H shown in Fig. 1,

Fig. 11 is a flow sheet illustration of a first sortation table system,

10 Fig. 12 is a flow sheet illustration of a second sortation table system,

Fig. 13 is diagrammatic illustration of information flow between a sortation subsystem and a database unit comprised in a preferred embodiment of a system according to the
15 invention,

Fig. 14 is a diagrammatic illustration of a system according to the invention for automatic sorting of postal items.

Detailed description of the drawings

20 Fig. 14 is an illustration of a system for processing postal items according to the invention which is suitable for carrying out a method according to the invention. The system is suitable for processing a postal item, such as a parcel 201, being sent from a departure location 200 to a
25 destination location 300. The parcel 201 is transported by a transporting means, such as a truck 220, from the departure location to a first item processing installation, such a mail center 202. At the mail center 202, the parcel 201 is conveyed along a conveyor section 221. At the conveyor
30 section 221, the parcel 201 is conveyed along an OCR-system 51a for optically capturing a first image of a printed or written address block provided on the parcel 201. In case the OCR system is capable of capturing and successfully processing an image of the address block, the data resulting
35 from the OCR capturing is passed to a first computer system 207 as indicated by the flash arrow 402, and the parcel 201

is processed further as described below. In case the OCR system is not capable of capturing an image of the address block or in case the OCR system is not capable of successfully processing the image, an indication thereof is passed to a VC system 51b as indicated by the flash arrow 401. At the VC system, the address block is automatically or semi-automatically captured, and the data resulting from the processing of capturing the image at the VC system is passed to the first computer system 207 as indicated by the flash arrow 403.

The first computer system 207 and any processor and/or data storage means comprised in the OCR-system 51a and in the VC-system 51b is comprised in or connected to a first control system which controls the processing of items or parcels 201 at the mail center 202. The first computer system 207 comprises or is connected to a first database in which second address data have previously been stored. Each entry of second address data in the first database corresponds to a unique address identification code. The address data resulting from the processing of capturing the image at the OCR or at the VC system is compared to the second address data, and if possible a unique address identification code is associated to each item. Otherwise, another address identification code, such as, e.g., a country code, is associated to each item. An item identification code is associated to each item, and a table of item identification codes and corresponding address identification codes is created and stored at the first computer system 207. A label representing the item identification code of each item 201 is printed on or attached to each item 201 prior to or subsequent to the OCR- and/or VC-scanning of the item as described above. The label represents the item identification code in a standard optical format. The label may, for example, comprise a bar code.

In case a large number of items 201 are sent from a single departure location 200, the label representing the item

identification code may be provided on the items 201 at the departure location 200. A table containing a list of item identification codes and corresponding destination address data may be passed from the departure location 200 either
5 directly or via a distributing entity's computer system 211 to the first computer system 207, as indicated by flash arrows 409 and 405. The destination address data may comprise the unique address identification code or other address identification data, such as, e.g., name of a recipient,
10 street name and street number, city, zip code, country name or country code and/or other appropriate data. In case the destination address data do not comprise the unique address identification code, the destination address data are processed at the first computer system 207 in order to
15 associate the unique address identification code to each item 201. If an item identification code has been provided on an item before the item has reached the mail center 202, only the item identification code is captured by the OCR-system 51a which is capable of capturing the item identification
20 code.

An item which has been provided with an item identification code before the item has reached the mail center 202 is referred to as and IT-item.

When the data resulting from the OCR- or the VC-process have
25 been passed to the first computer 207, the parcel 201 is conveyed to a weighing section 222. The weighing section 222 is preferably equipped with an electronic weighing system which is capable of passing weight data to the first computer system 207. Before the parcel 201 is being passed to a
30 sorting conveyor 204, a optically readable parcel identification code is attached or printed on the parcel 201.

From the weighing section, the parcel 201 is fed onto the sorting conveyor 204 for sorting items. At the sorting conveyor 204, the parcel 201 is conveyed along or past a
35 volume scanning system 213 for measuring or scanning the

volume of the parcel 201. Preferably, the volume scanning system 213 is capable of passing volume data to the first computer system 207 together with parcel identification information. The parcel identification information is
5 preferably derived from the parcel identification code.

From the sorting conveyor 204, each parcel 201 is discharged at a selected one of a plurality of discharge stations, as indicated by arrows at 205. The discharge station at which a given item is to be discharged is selected by the first
10 control system, e.g., by the first computer system 207. As indicated by flash arrow 404, the first computer system 207 sends a signal to control means comprised in the discharge stations 205. At the discharge stations 205, means are
15 provided for capturing the optically readable identification code so as to identify any parcel being conveyed along a discharge station.

In the example shown in Fig. 14, the mail center 202 is a main mail center of, e.g., a region, a city or country, at which mail from a plurality of departure locations 200 is
20 collected. Items 201 may be transported either directly from their respective departure locations 200 to the mail center 202, or items 201 may be transported from their respective departure locations 200 to a mail box, a post office or another location (not shown) and from there to the mail
25 center. At the mail center 202, a first processing and sortation of the items 201 is carried out as described above. The first processing and sortation results, e.g., in sortation of items 201 according to city, region or country of the respective destination locations of the items 201.
30 Accordingly, each discharge station 205 represents a city, region or country, and a plurality of items 201 is collected at each discharge station. In addition, special discharge stations 205, e.g., for special items, such as fragile items, may be provided.

From the discharge stations 205, the items are transported by a transport means, such as a truck 220, to a second item processing installation, such as a second mail center 203. The second mail center 203 may, e.g., be a regional post office. In the example shown, the second mail center 203 comprises a second control system which comprises a second computer system 208. As indicated by flash arrow 416, the second computer system is operationally connected to the first computer system 207. At the second mail center 203, the items 201 are automatically sorted and distributed to a number of discharge stations as indicated by arrows at 206. Preferably, sorting of items 201 at the second mail center 203 is carried out automatically and is controlled by the second computer system 208 which is operationally connected to the discharge stations 206, as indicated by flash arrow 415. At the discharge stations 206, the items 201 are sorted, e.g., according to cities, streets, companies or other appropriate sortation data. From the discharge stations 206, the items 201 are transported by a transporting means, such as, e.g., a truck 220, to the destination location 300.

In the example shown in Fig. 14, accounting means for automatically billing or invoicing carriage costs is provided. The accounting means comprise a tracking and invoicing computer system 209 operationally connected to the first and the second computer systems 207 and 208, respectively, as indicated by flash arrows 407 and 411. Invoicing data or invoicing factors, such as weight and/or volume of items 201 and/or travelling distance of items are passed from the first and/or the second computer systems 207 and 208, respectively.

When an item or a plurality of items has/have been delivered at a destination location or at a number of destination locations, delivery information is passed from a delivery means, such as delivery person 214 to the tracking and invoicing computer system 209, as indicated by flash arrow 412. The delivery information comprises a table of item

identification information together and corresponding delivery addresses. In most case, the delivery address is identical to the address of the destination location. However, if an error has occurred during the processing of an
5 item 201, the delivery address of an item 201 may be different from the address of the destination location.

The computer systems 209, 210 and 211 may, e.g., be located at an item distributing entity. When an item has been delivered at a destination 300 and corresponding information
10 has been passed to the tracking and invoicing computer system 209, information is passed from the computer system 209 to a billing or invoicing means or entity 215. As indicated by flash arrow 417, an invoice is electronically passed or sent to a debtor or a debtor entity which, in the example shown,
15 has his address or place of business at the departure location 200.

A sequence generating computer system 210 is adapted to generate sortation and/or distributing sequences or sortation patterns for items. Thus, the sender of an item, or a
20 distributing entity, may generate the sortation and/or distributing sequences for a plurality of items. Such sequences are passed from the sequence generating computer system 210 to the first and second computer systems, respectively, as indicated by flash arrows 406 and 410. The
25 sequence generating computer system 210 is operationally connected to the distributing entity's computer system, as indicated by flash arrow 408.

Fig. 1 illustrates subsystems and databases comprised in a system according to the invention, e.g., a system as
30 illustrated in Fig. 14. The system comprises an OCR and/or VC subsystem 51 for OCR and/or VC capturing of an address block provided on a postal item. The system further comprises a first sortation subsystem 52 and second sortation subsystem 53. Five database systems are provided and will be explained
35 in further detail below: a PIB (Postal installation Inhouse

dataBase) database 54, a receiving database 55, a trace and track database 56, a sortation pattern database 57, and a sortation database 58. The PIB database 54, the receiving database 55, the trace and track database 56 and the

5 sortation database 57 are database systems pre-installed at the item processing installation. Interfaces A, B, C, D, F, G, H and I are provided for exchange of information between the databases and the subsystems. For the sake of clarity, the following interfaces are not shown in Fig. 1: interfaces

10 between the OCR and/or VC subsystem 51 and the pre-installed databases 54, 55, 56, 57, interfaces for communication between the first sortation subsystem 52 and the second sortation subsystem 53, and interfaces for communication between first and second sortation subsystems provided at

15 different item processing installations.

The system shown in the drawings is capable of capturing comprehensive amounts of data. Thus, in a relative short time, the entire or almost the entire destination of an item may be captured, and a unique identification code may be

20 associated to the item. The unique identification code is stored at a database electronically connected to the control system of the combined OCR and VC system and is associated to the item by looking up the information captured by the OCR and VC system in a table containing unique identification

25 codes as well as destination addresses. In case the address or destination information captured by the OCR and VC system is not found in the database, an identification code according to at least a part of the destination information (e.g. country and/or city information) is associated to the

30 item, and the item will be further processed using a further system which may be manual or automatic.

The PIB (Postal installation Inhouse dataBase) database 54 is adapted to receive item information, such as item identification information and destination address data, from

35 a plurality of departure locations. Other information concerning the items, such as information related to the

content of a parcel, may be sent from a sending entity to the PIB database 54. It is preferred that only sending entities, such as companies, sending a large number of items, may submit data to the PIB database 54.

- 5 The receiving database 55 comprises the second address data, i.e. address data of a large number of item receiving persons or entities, i.e. address data of a large number of destination locations. Each destination location corresponds to a database entry in the receiving database 55 and
- 10 comprises a unique address identification code, such as, e.g. a 10-digit number. The database entries further comprise alternative spellings of street names, location names, city names and/or country names which is used, e.g., for automatic spelling check of address data provided on items and captured
- 15 by the OCR/VC system 51 or entered manually. Destination locations of private people are preferably identified by zip-code, street name, street number and optionally street letter. Via interface B, data from the receiving database 55 are passed to the sortation database 58.
- 20 The trace and track database 56 contains information concerning any item that has been registered in connection with sortation at the first or second sortation subsystem 52 and 53, respectively. Via interface D, the trace and track database 56 receives information concerning any registered
- 25 item.

The a sortation pattern database 57 contains a plurality of sortation patterns or sortation sequences. Different sortation patterns or sortation sequences for different second mail centres 203 may be stored at the sortation

30 pattern database 57. The database 57 is preferably updated at regular intervals, such as once per day. The sortation pattern may comprise a table for converting unique address identifications codes to a district number which may be used for looking up addresses or other data in further sorting

tables. The sortation patterns are updated via interface C, and through interface C, a sortation pattern may be selected.

The sortation database 58 is an independent database system which, via database B, may receive information from the receiving database 55. The sortation database is capable of associating a unique address identification code to an item. The sortation database 58 further serves as a host computer system in connection with manual entry of data at the first and second sortation subsystems 52 and 53, respectively. Via interface H, the unique address identification code may be passed to the control system of the first and second sortation subsystems 52 and 53. Street names are downloaded via interface I.

The sortation database 58 further comprises a database unit adapted to convert item identification codes to unique address identification codes. The database unit may receive information from further mail processing installations or mail centres or, via interface F, receive information from the OCR/VC system. The control systems of the first and second sortation subsystems 52 and 53 may pass item identification code to the database unit 58 through interface G, and in response receive, through interface G, corresponding unique address identification codes.

The system shown in the drawings may comprise two first sortation subsystems 52 which are automatic and controlled by a control system. The second sortation subsystem 53 is at least partly manual and is controlled by a control system. The control systems of the first and of the second sortation subsystems are connected to the databases described above. The databases and the control systems are comprised in the one or more first control systems of the first item processing installation.

Through interface A, the sortation database 58 receives information concerning IT-items, i.e. items which have been

provided with item identification codes before the items have reached the mail processing installation, registered at the PIB database 54 through interface A. Through interface B, the version of the receiving database 55 stored in the sortation database 58 is updated. It is possible, through interface B, to transmit all and any data from the receiving and address databases, and it is further possible to transmit modifications to the receiving database 55.

Any time an item is registered in connection with sortation at the sortation subsystems 52 and 53, the trace and track database 56 receives sortation pattern or sortation sequence data 58 through interface D. The sortation database 58 is updated through interface F.

Through interface H, the control systems of the first and second sortation subsystems 52 and 53 may receive zip code and other address information which has manually been entered. The following information is passed from the first and second sortation subsystems 52 and 53 to the sortation database 58: zip code, street name, location or city name, street number and street letter. The sortation database 58 responds in passing address information, such as the unique address identification code to the control systems of the first or second sortation subsystems 52 and 53. In case the sortation database 58 is not capable of finding the needed address information, an error code indicating that the address is not known is passed to the control systems of the first or second sortation subsystems. In case a plurality of companies have been found on the requested address, a list of possible companies is passed to the control systems of the first or second sortation subsystems.

Data and street names per zip code are passed through interface I in order to carry out a local encoding or local data entry procedure.

Preferably, all information through the interfaces is carried out as file transfer using FTP file transfer.

In the following, an estimate of typical amounts of data being transferred through the interfaces will be given
5 together with an estimate of typical processing times of transmitting data through the interfaces. The numbers given below are examples of possible/typical values.

Per day information concerning approximately 80000 IT-items may be passed per day. Thus, approximately 80000 database
10 records are transferred. A file being transferred may contain between 1000 and 10000 records, and the processing or transmitting time per file will be between 3 and 23 minutes.

Approximately two times per year address data is passed to the ~~sortation database 58 through interface B. Excessive~~
15 amounts of data are being passed, and therefore data are to be transferred when no processing of items is being carried out. Approximately 3000000 records are to be transferred, and the processing or transmitting time is approximately 6-10 hours, such as 8.5 hours due to the fact that the excessive
20 amounts of data are to be read and written from/to a hard disk or another storage means.

Approximately two times per year, data from the receiving database 55 are transferred through interface B.
Approximately 700000 to 1000000 records are being
25 transferred, corresponding to 50-100 MB. The time of processing or transmitting is approximately 1-5 hours, such as 2.5 to 3 hours, and therefore data are to be transferred when no processing of items is being carried out. Following transferring of data, data are to be processed for another
30 approximately 1.5 hours, e.g., at the control systems of the sortation subsystems.

Modified records are normally transferred from the receiving database 55 on a daily basis. Approximately 4000 records,

i.e. 4000 deleted records and 4000 inserted records, are transferred, and the processing or transmitting time is approximately 7 minutes followed by further processing, such as processing at the control systems of the sortation subsystems 52 and 53.

Data related to country codes are transferred through interface B on a weekly basis. Approximately 500 records are to be transferred, and the processing time is normally less than 3 minutes followed by further processing, such as processing at the control systems of the sortation subsystems 52 and 53.

Through interface C, sortation patterns or sortation sequences are transferred once per month. At the same time, a sequence file is being transferred. The file containing sortation pattern information has approximately 300 records, and processing of the file lasts for approximately 7 minutes. The sequence file contains approximately 6000000 records, corresponding to approximately 180 MB, and processing of the file will last approximately 17 hours. Therefore data are to be transferred when no processing of items is being carried out.

When the sortation database 58 has received and processed data from the receiving database 55, a file containing all street names belonging covered by any and all zip codes is created. This file is transferred to the control systems of the first and second sortation subsystems 52 and 53 through interface I. The file contains approximately 300000-400000 records, and the processing time at the control systems of the sortation subsystems is approximately 1,5 hours. Through interface I, new or modified country codes are transferred to the control systems of the sortation subsystems which lasts approximately 3 minutes.

Processing and/or transferring times may be reduced by:

- transferring only selected data records instead of complete sets of data records,
- transmitting files well before they are needed at the respective receiving systems and processing data whenever there is processing capacity available,
- utilising a separate server for generating the necessary databases and subsequently transferring the data to the respective databases/computer systems.

Fig. 2 is a diagrammatic illustration of computer systems and databases comprised in a preferred embodiment of a system according to the invention. The sortation database comprises two systems: the sortation database itself 58a and the database unit 58b. The control systems of the first sortation subsystem comprises two computer systems 61 and 62, and the control systems of the second sortation subsystem comprises two computer systems 63, 64. The computer systems 61, 62, 63 and 64 may themselves represent control systems of sortation subsystems, in which case two first and two second sortation subsystems are provided. Two operating terminals 65 and 66 are provided. The computer and database systems shown in Fig. 2 are linked through ethernet connections 71, 72 and 73.

Fig. 3 is a diagrammatic illustration of the sortation database 58a and an associated computer system. The database itself is labelled 80, whereas operations being carried during processing of data are illustrated by means of rectangular boxes labelled 81, 82, 83 and 84. Processing which is being carried out when no items are being processed is indicated by a box 86. Data are received from the receiving database 55, processed at 82 and passed to the database 80. At 84, zip codes and street names are downloaded to the computer systems 61, 62, 63, 64 of the control systems of the first and second sortation subsystems. At 83, data are requests for data from the computer systems 61, 62, 63, 64 are received, and responds are passed to those computer systems. At 81, data from the PIB database are received, and

addresses are converted to unique address identification codes and passed to the database unit 58b.

Fig. 4 is a diagrammatic illustration of the interfaces to and from the sortation database 58. The above description in connection with Fig. 1 applies to Fig. 4.

Fig. 5 is a diagrammatic illustration of the interfaces to the sortation database unit 58b. The above description in connection with Fig. 1 applies to Fig. 5. Preferably, the database unit 58b may be exchanged by a backup unit (not shown).

Fig. 6 is a diagrammatic illustration of an automatic sortation system. The system of Fig. 6 is appropriate to items for which an identification code and a unique address identification code has been associated. Such items may be items which have successfully been OCR- or VC-processed, as indicated by arrow 51p, items coming from another mail processing installation, as indicated by arrow 203p or IT-items, as indicated by arrow 54p. The item identification code and the unique address identification code is known and processed by an automatic processing database 87 which is preferably comprised in the database unit 58b. Sortation of items is carried out as follows:

1. An item is fed onto the sorting conveyor 204, cf. Fig. 14, while a feeding system for feeding items onto the sorting conveyor is in automatic mode, i.e. no manual entry of address data is carried out.
2. The optically readable item identification code is captured by a scanner.
3. The control system of the sortation subsystem or the sorting conveyor 204 passes a converting request to the database unit 58b which converts the item identification code to a corresponding unique address identification code. Converting is performed on the basis of data previously passed to the database unit 58b.

4. The discharge station 205 at which a given item is to be discharge is determined by means of the sortation pattern and primary and/or secondary sorting tables.

If the unique address identification code corresponds to a post box, the sortation pattern is not used. In such case, the unique address identification code is used directly with the sorting tables.

When the scanner has captured the item identification code, the sortation tables are used as illustrated in Fig. 7. The item identification code is passed from the control system 61, 62 of the sorting conveyor 204 to the database unit 58b, as indicated by arrow 88. The unique address identification code is passed from the database unit 58b to the control system 61, 62 of the sorting conveyor 204 as indicated by arrow 89. The unique address identification code is looked up in the sorting tables 90, and discharged at discharge stations 205 in accordance with sortation pattern tables 91. The sortation pattern table 91 stores any and all unique address identification codes which, according to the example given above, comprises approximately 3000000 records. However, this number may be reduces by using only one unique address identification code for a plurality of address, such as, e.g., a number of apartments located in the same apartment block.

Fig. 8 is a flow sheet illustration the information flow in the system in connection with items which have been scanned by the OCR/VC-system. Due to an error or unforeseen circumstances, it may happen that the item identification code and the associated unique address identification code has been recorded in the database unit 58b when the corresponding item is fed onto the sorting conveyor. Therefore, conversion of codes must be repeated, when data from the OCR/VC-system 51 arrive. At 95 it is determined whether the item identification code has been scanned. If this is the case a discharge station is associated to the item in question, as indicated by arrow 93 and process box

94. If the item identification has not been scanned, a signal indicating this fact is passed to the database 58b, as indicated by arrow 92.

Fig. 9 is a flow sheet illustration an encoding procedure for items which are being manually encoded. At 101, the zip code is entered down to the most specific level possible. At 102, street name or post box is entered until the street name or post box is complete defined within the zip code entered at 101. In case the entered street name occurs more than once within the zip code entered, an operator is prompted for entering further address data. At 103, house or street number is entered. Steps 101, 102 and 103 marked by box 100 are related to the control systems of the sortation subsystems only. When step 103 has been completed, the data entered are passed to the sortation database 58, as indicated by arrow 104. The sortation database passes information from the receiving database 55, as indicated by arrow 105, the information comprising also an indication of whether the destination location is a corporate location. If this destination location is a corporate location, a list of possible companies is passed from the sortation database, and the operator may choose the correct company from the list.

At 106, it is determined whether the address identification information passed from the sortation database is unique. If this is not the case, the process is continued at 109, arrow 107 indicating that the address identification information is not unique. If the address identification information passed from the sortation database is unique, the procedure is ended at 115, as indicated by arrow 108, box 115 indicating that a unique address identification number has been determined. At 109, it is determined whether a company is located at the non-unique destination address. If yes, the process is continued at 122, as indicated by arrow 110, the company name being chosen by the operator at 112. If no, the process is continued at 116, as indicated by arrow 111. At 116, an identification for the house or street number is entered so

as to determine a unique address identification number which is passed to or from 115 as indicated by arrow 114.

Fig. 10 is a diagrammatic illustration of interface H shown in Fig. 1 illustrating the information flow along arrows 104 and 105 in Fig. 9.

Fig. 11 is a flow sheet illustration of a first sortation table system. Address information is passed into the system as indicated by arrow 121. The information is passed to a memo table 122 from which a district identification code is determined. The district code is preferably a 10-digit number. The district code is passed to a primary sortation table from which a destination and/or a discharge station is determined, if possible. If a destination and/or discharge station is determined, the process is continued at 125 where further, optional processing is carried out, and the destination and/or discharge station identification is passed further on as indicated by arrow 126. If a destination and/or discharge station is not determined, the district code is processed at 125 in a secondary sortation table in order to determine a destination and/or discharge station, and the process is continued at 125 as described above. The resulting destination and/or discharge station identification comprises zip code and an address identification number.

Fig. 12 is a flow sheet illustration of a second sortation table system which in addition to the steps indicated in Fig. 11 and described above, comprises determining a sortation pattern code at 127. The resulting destination and/or discharge station identification at 126 comprises group information, distributing route information and sortation pattern information.

Fig. 13 is diagrammatic illustration of information flow between the second sortation subsystem and the database unit 58b. When the scanner has captured the item identification code, the sortation tables are used as illustrated in Fig.

13. The item identification code is passed from the control system 63, 64 of the second sortation subsystem comprised in the sorting conveyor 204 to the database unit 58b, as indicated by arrow 88. The unique address identification code
5 is passed from the database unit 58b to the control system 63, 64 of the sorting conveyor 204 as indicated by arrow 128.

Fig. 14 which has been described in detail above is an overall illustration of a preferred embodiment of a system according to the invention.

10 The first and second sortation subsystems may comprise any kind of manual or automatic sortation systems. Typically, the first sortation subsystem is a full automatic sortation system controlled by a control system which communicates with the databases as described above. The first sortation
15 subsystem is typically suited for "normal" items, i.e. items having a weight and dimensions within predetermined ranges and/or items which have successfully been scanned by the OCR_VC-system 51. The second sortation subsystem is typically suited for items having a weight and/or dimensions beyond the
20 predetermined ranges and/or items which have not been successfully scanned by the OCR/VC-system 51. The sortation subsystems may comprise further equipment, such as hand scanning devices or other scanners, weights, communication devices such as modems, and printers.

CLAIMS

1. A method for processing postal items, each item being sent from a departure location to a destination location, the method comprising:
- 5 (a) delivering items to an item receiving part of a first item processing installation, the first installation being adapted to collect and process items from a plurality of departure locations and comprising one or more first control systems for controlling the processing of items,
- 10 (b) conveying each item along a first system for optically capturing a first image of a printed or written address block optionally provided on the items,
-
- ~~(c) processing the first image to derive first address data,~~
- (d) passing the first address data to a first computer system
- 15 comprised in the at least one first control system,
- (d_{ii}) processing the first address data of an item in order to determine whether or not it is sufficient in order to automatically sort and distribute the item in question, and
- 20 - if the first address data is sufficient: going to step (e),
- if the first address data is insufficient: going to step (f),
- (e) comparing the first address data to second address data previously stored in a first database comprised in or
- 25 connected to the first computer system, and
- if the first address data of an item is identical or nearly identical to an entry of second address data in the first database: associating a unique address identification code the item in question and going to
- 30 step (g),

- if the first address data of an item is not identical or nearly identical to any entry of second address data in the first database: associating an error code to the item in question and going to step (g) or
5 transporting the item in question to further manual or automatic processing thereof,

(f) conveying the items along a second system for optically capturing a second image of the address block, and

- processing the second image to derive third address
10 data,
- ensuring by automatic or manual means that the third address data is sufficient in order to automatically sort and distribute the item in question,
- storing the third address data as the first address
15 data and going to step (e),

(g) conveying each item along a sorting conveyor adapted to sort items, the sorting conveyor comprising a plurality of discharge stations and means for unloading items being conveyed along the sorting conveyor, discharging of items
20 being controlled by the first computer system,

(h) discharging each item at a discharge station, the discharge station being automatically selected by the first computer system according to the unique address identification code or according to the error code,

- 25 (j) optionally transporting the items for further processing thereof or delivery thereof at the respective destinations.

2. A method according to claim 1, wherein the first image is being captured while the item in question is being conveyed along the sorting conveyor.

3. A method according to claim 1 or 2, wherein the second image is being captured while the item in question is being conveyed along the sorting conveyor.

4. A method according to any of claims 1-3, wherein the
5 second image is being captured by a video coding system.

5. A method according to any of claims 1-4, wherein the second image is being captured by a human, the information provided by the second image being passed to the first computer system by manually entering the information.

10 6. A method according to any of claims 1-5, wherein step (e) further comprises performing spelling checking at least part of the first address data.

7. A method for processing postal items, each item being sent
from a departure location to a destination location, the
15 method comprising:

(a) providing an item with an optically readable identification code in a standard format at the departure location, the identification code corresponding to a unique address identification code stored at a storage means
20 comprised in a computer system comprised in or connected to a first control system comprised in a first item processing installation,

(b) delivering items to an item receiving part of the first installation, the first installation being adapted to collect
25 and process items from a plurality of departure locations and comprising one or more first control systems for controlling the processing of items,

(c) passing the identification code together with a destination code of the item from the departure location to
30 at least one of the one or more first control systems, the

destination code identifying the address of the destination location of the item,

(d) storing the destination code in the storage means and processing the destination code so as to associate the
5 destination code to the corresponding unique address identification code,

(e) scanning the optically readable identification code at the item processing installation by means of a code scanning device adapted to pass the identification code to at least
10 one of the one or more first control systems,

(f) processing the identification code so as to associate the corresponding unique address identification code to the item,

(g) conveying each item along a sorting conveyor adapted to sort items, the sorting conveyor comprising a plurality of
15 discharge stations and means for unloading items being conveyed along the sorting conveyor, discharging of items being controlled by a first computer system comprised in the one or more first control systems,

(h) discharging each item at a discharge station, the
20 discharge station being automatically selected by the first computer system according to the identification code associated to the item in question,

(j) optionally transporting the items for further processing thereof or delivery thereof at the respective destinations.

25 8. A method according to claim 7, further comprising, prior to or during step (e), the step of determining whether the identification code is present on the item and in such case whether it is readable by the code scanning device.

30 9. A method according to claim 8, further comprising the step of processing the item in question by a method according to

any of claims 1-6 in case step (e) or (f) of claim 7 fails or in case the identification code is not present or unreadable, the first item processing installation of claims 1-6 being the first item processing installation of claims 7 or 8.

- 5 10. A method according to any of claims 7-9, wherein the identification code is being scanned while the item in question is being conveyed along the sorting conveyor.

11. A method according to any of claims 1-6 or any of claims 7-10, further comprising the step of weighing at least some
10 of the items being processed at the first installation.

12. A method according to any of claims 1-6 or any of claims 7-11, further comprising the step of automatically measuring or scanning the volume of at least some of the items being
~~processed at the first installation, the measuring or~~
15 scanning being performed by means of a volume scanning system.

13. A method according to claim 12, wherein the measuring or scanning is performed on the sorting conveyor while the item in question is being conveyed along the sorting conveyor.

- 20 14. A method according to any of claims 1-6 or any of claims 7-13, further comprising the step of passing weight information representing the weight of the item in question to a computer system comprised in the at least one first control system.

- 25 15. A method according to any of claims 12-14, further comprising the step of passing volume information representing the volume of the item in question to a computer system comprised in the at least one first control system.

16. A method according to any of claims 1-6 or any of claims
30 7-15, further comprising, subsequent to step (j) of claims 1 and 7, transporting a plurality of items from the first

installation to a second item processing installation, the second item processing installation being adapted to further process the items.

17. A method according to any of claims 1-6 or any of claims 5 7-16, wherein the unique address identification code at least represents the city or local district, street name and the street number of the destination location.

18. A method according to claim 17, wherein the unique address identification code further represents the country of 10 the destination location.

19. A method according to claim 17 or 18, wherein the unique address identification code further represents the name of the addressee.

20. A method according to any of claims 17-19 as dependent on 15 claim 7, further comprising, subsequent to step (c) of claim 7, comparing the destination code and/or the unique address identification code to second address data previously stored in a first database comprised in or connected to the one or more first control systems in order to verify the destination 20 location of an item.

21. A method according to any of claims 1-6 or claim 20, wherein the one or more first control systems comprised in the first installation are connected to an exterior database in which names and address of a large number of persons is 25 stored, the method further comprising:

- automatically associating the unique address identification code corresponding to the modified second address data to an item in case the first address data or the destination code correspond to the non-modified 30 second address data.

22. A method according to any of claims 1-6 or any of claims 7-21, wherein the postal items comprise envelopes.

23. A method according to any of claims 1-6 or any of claims 7-21, wherein the postal items comprise parcels.

24. A method according to any of claims 1-6 or any of claims 7-23, the method further comprising, prior to step (g) of claim 1 or claim 7, bypassing all or some of steps (b)-(j) in case the weight and/or the dimensions of a postal item exceeds previously determined limits.

25. A method according to any of claims 1-6 or any of claims 7-24, further comprising, subsequent to step (j), transporting at least some of the items to a second item processing installation for further processing of the items.

26. A method according to claim 25, wherein the second item processing installation comprises a second control system for ~~controlling processing of items, the second control system~~ being connected to the one or more first control systems, the method further comprising, subsequent to step (e) or (f) of claim 1 or subsequent to step (c) of claim 7:

(I) passing destination information, such as the unique address identification code, together with item identification data from the first control system to the second control system, and

(II) providing each item with an optically readable item identification code.

27. A method according to claim 26, further comprising capturing the optically readable item identification code at the second item processing installation and deriving therefrom the corresponding item identification data and destination information and sorting items according to the respective destination information.

28. A method according to any of claims 1-6 or any of claims 7-27, further comprising passing a table comprising item identification information and destination information associated to a plurality of items from the one or more first

controls systems to the second control system or from the second control system to a third control system comprised in a third item processing installation optionally provided.

29. A method according to claim 28, comprising, at the second
5 or the third control system, processing the destination information associated to each item, so as to derive the address of the destination location from the destination information.

30. A method according to claim 28 or 29, further comprising
10 printing the table and/or a list of addresses of destination locations of items and delivering the items associated to the item identification information listed or stored in the table at the respective destination locations of the items.

31. A method according to claim 28, further comprising
15 automatically delivering the items associated to the item identification information listed or stored in the table at the respective destination locations of the items.

32. A method according to any of claims 26-31, wherein a plurality of second item processing installations are
20 provided, step (I) of claim 120 comprising passing the destination information together with item identification data from the first control system to the respective second control systems in accordance with the destination information, whereby destination information and item
25 identification information associated to an item being transported to a certain second item processing installation is being passed to that second item processing installation.

33. A method according to any of claims 1-6 or any of claims 7-32, wherein the step of capturing the first image of a
30 printed or written address block provided on items and/or the step of scanning the optically readable identification code is carried out by means of an optical character recognition system.

34. A method according to claim 33, wherein the optical character recognition system comprises an auto focus system, the step of capturing the first image and/or the step of scanning the identification code comprising auto focusing on a relevant part of the item in question.

35. A method according to any of claims 1-6 or any of claims 7-34, further comprising the step of passing data to an item tracking database connected to or comprised in the one or more first control systems, in the second and/or in the third control system when an item has been delivered at a destination location or at other events during the steps of processing an item.

36. A method according to any of claims 1-6 or any of claims 7-35, further comprising passing volume and/or weight data from the one or more first control systems to an account database connected to or comprised in an account computer system.

37. A method according to claim 35 and 36, wherein the account computer system is connected to or comprised in the item tracking database, the method comprising automatically invoicing carriage costs by:

- computing the carriage costs in dependency of the weight and/or volume of an item and optionally in dependency of one or more further factors,
- printing an invoice and sending it to a debtor and/or electronically forwarding the invoice to the debtor.

38. A method according to any of claims 35-37, wherein a plurality of item tracking databases and/or a plurality of account computer systems are provided, the steps of passing data of claims 35-37 comprising passing the data to a selected one of the plurality of item tracking databases and/or to a selected one of the plurality of account computer systems, respectively.

39. A method according to any of claims 16-38, further comprising:

- generating a sortation sequence or sortation pattern in the one or more first control systems or in the second control system, the sortation sequence or sortation pattern comprising information as to the sequence of further sortation of a plurality of items.

40. A method according to claim 39, wherein the sortation sequence or sortation pattern comprises information as to the sequence of further sortation of a plurality of items at the second item processing installation or at other locations, the sortation sequence or pattern being generated in the one or more first control systems, the method comprising passing the sortation sequence or sortation pattern from the one or more first control systems to the second control system or to another control system.

41. A method according to any of claims 7-40, further comprising generating sortation data or sortation information for a plurality of items at the departure location prior to step (b) of claim 7 and passing such data or information to the one or more first control systems directly or through a sortation data generating computer system.

42. A method according to claim 41, further comprising passing information from the sortation generating computer system to the account computer system or to the tracking database or passing information from the account computer system or from the tracking database to the sortation generating computer system.

43. A method according to claim 42, wherein a plurality of sortation data generating computer systems are provided, the method comprising passing sortation data from the plurality of sortation data generating computer systems to the one or more first computer systems.

44. A method according to any of claims 35-43, wherein one or more of the item tracking database(s), the account computer system(s), the sortation data generating computer systems and/or of one or more other systems or database are placed at
5 a location other than the first and the second item processing installation.

45. A system for processing postal items, each item being sent from a departure location to a destination location, the system comprising:

10 - an item receiving part for receiving items at first item processing installation, the first installation being adapted to collect and process items from a plurality of departure locations and comprising one or more first control systems for controlling the processing of items,

15 - a first system for optically capturing a first image of a printed or written address block optionally provided on the items,

- means for processing the first image to derive first address data,

20 - means for passing the first address data to a first computer system comprised in the at least one first control system,

- processor means for processing the first address data of an item in order to determine whether or not it is sufficient in
25 order to automatically sort and distribute the item in question,

- processor means for comparing the first address data to second address data previously stored in a first database comprised in or connected to the first computer system,
30 and

- means for associating a unique address identification code the item in question,
- means for an error code to the item in question,
- means for transporting the item in question to further
5 manual or automatic processing of the item,
- means for conveying the items along a second system for optically capturing a second image of the address block, and
 - processor means for processing the second image to derive third address data,
- 10 - means for ensuring by automatic or manual means that the third address data is sufficient in order to automatically sort and distribute the item in question,
- storage means for storing the third address data as
15 the first address data,
- a sorting conveyor adapted to sort items, the sorting conveyor comprising a plurality of discharge stations and means for unloading items being conveyed along the sorting conveyor, discharging of items being controlled by the first
20 computer system,
- a plurality of discharge stations arranged along the sorting conveyor, the discharge station being automatically selected by the first computer system according to the unique address identification code or according to the error code,
- 25 - optionally means for transporting the items for further processing thereof or delivery thereof at the respective destinations.

46. A system according to claim 45, further comprising means for carrying out some or all of the method steps of any of claims 1-6.

47. A system for processing postal items, each item being
5 sent from a departure location to a destination location, the system comprising:

- means for providing an item with an optically readable identification code in a standard format at the departure location, the identification code corresponding to a unique
10 address identification code stored at a first storage means comprised in a computer system comprised in or connected to a first control system comprised in a first item processing installation,

~~- delivering means for delivering items to an item receiving~~
15 part of the first installation, the first installation being adapted to collect and process items from a plurality of departure locations and comprising one or more first control systems for controlling the processing of items,

- means for passing the identification code together with a
20 destination code of the item from the departure location to at least one of the one or more first control systems, the destination code identifying the address of the destination location of the item,

- second storage means for storing the destination code in
25 the first storage means and processing the destination code so as to associate the destination code to the corresponding unique address identification code,

- scanning means for scanning the optically readable identification code at the item processing installation by
30 means of a code scanning device adapted to pass the identification code to at least one of the one or more first control systems,

- processing means for processing the identification code so as to associate the corresponding unique address identification code to the item,
- means for conveying each item along a sorting conveyor adapted to sort items, the sorting conveyor comprising a plurality of discharge stations and means for unloading items being conveyed along the sorting conveyor, discharging of items being controlled by a first computer system comprised in the one or more first control systems,
- 10 - means for discharging each item at a discharge station, the discharge station being automatically selected by the first computer system according to the identification code associated to the item in question,
- (j) optionally means for transporting the items for further processing thereof or delivery thereof at the respective destinations.

48. A system according to any of claims 45-47, further comprising means for carrying out some or all of the method steps of any of claims 7-44.

Fig. 1

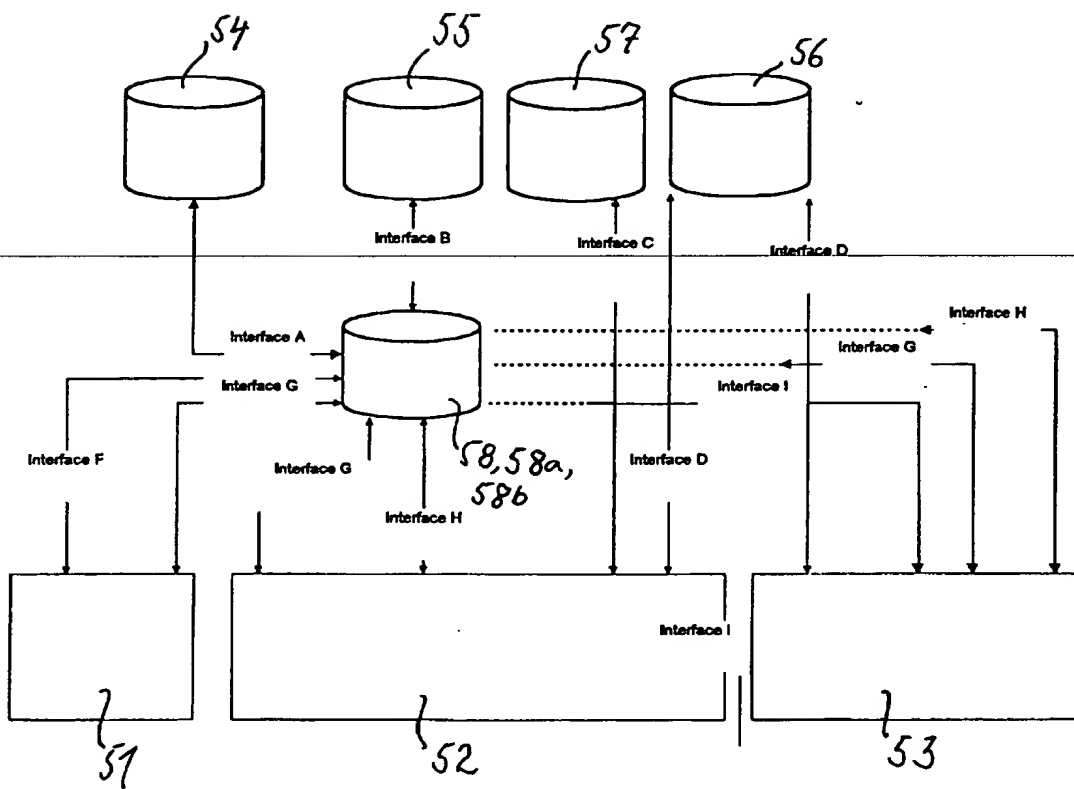


Fig. 2

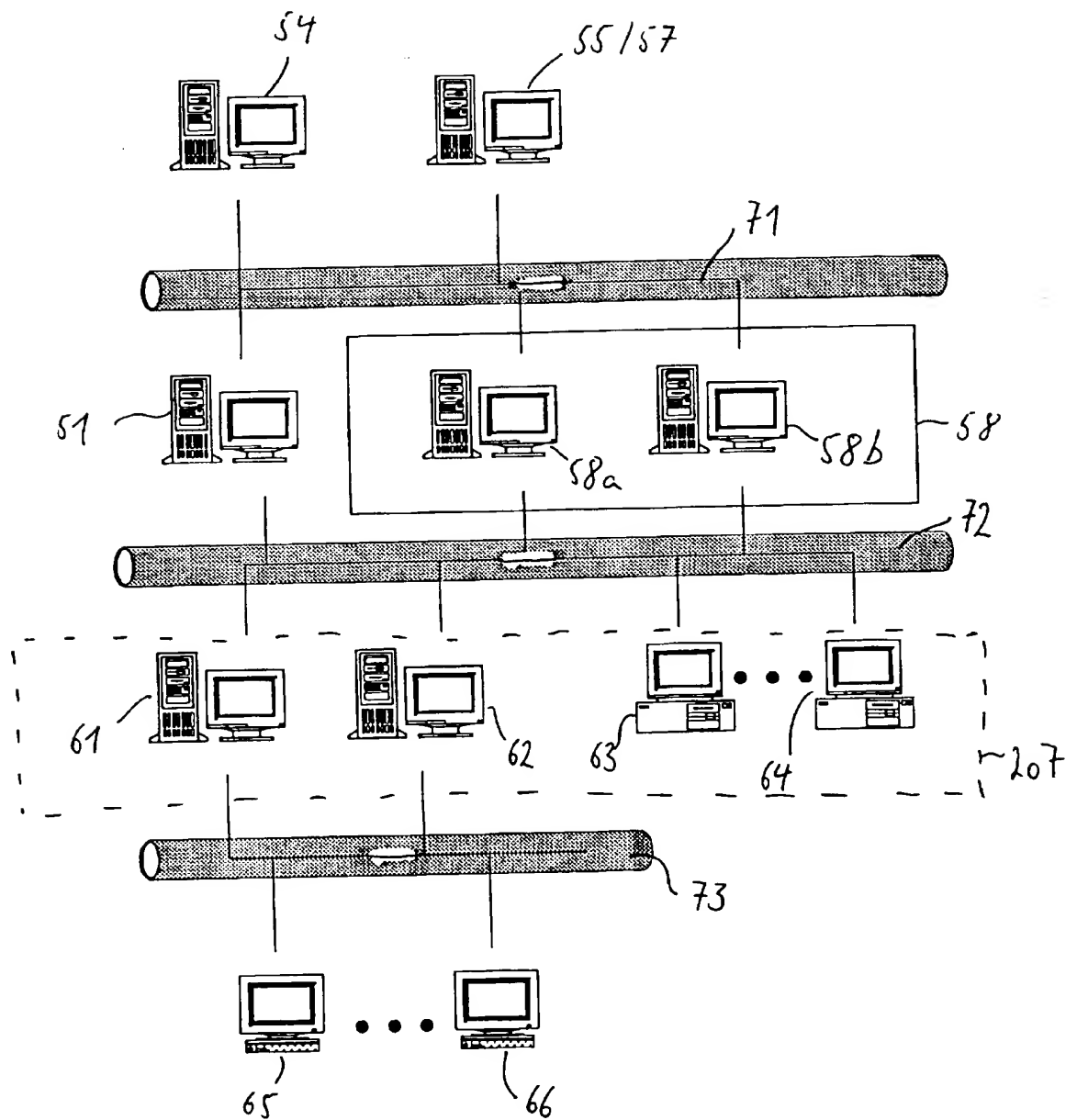


Fig. 3

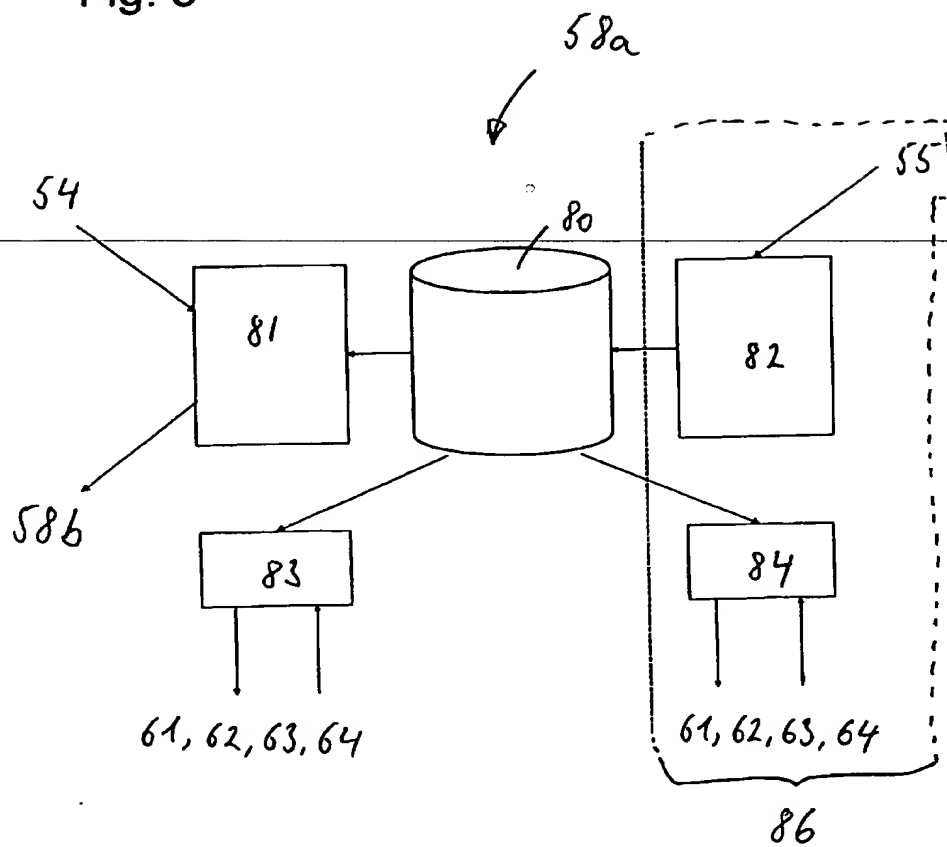


Fig. 4

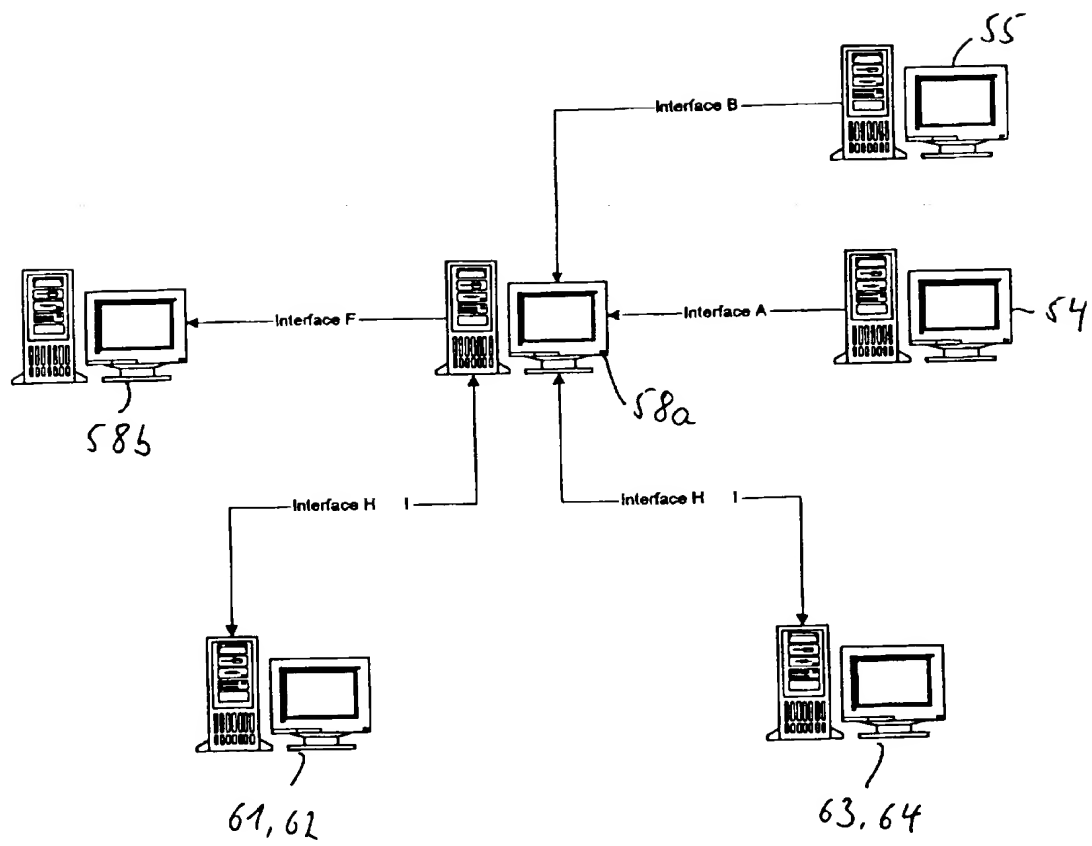


Fig. 5

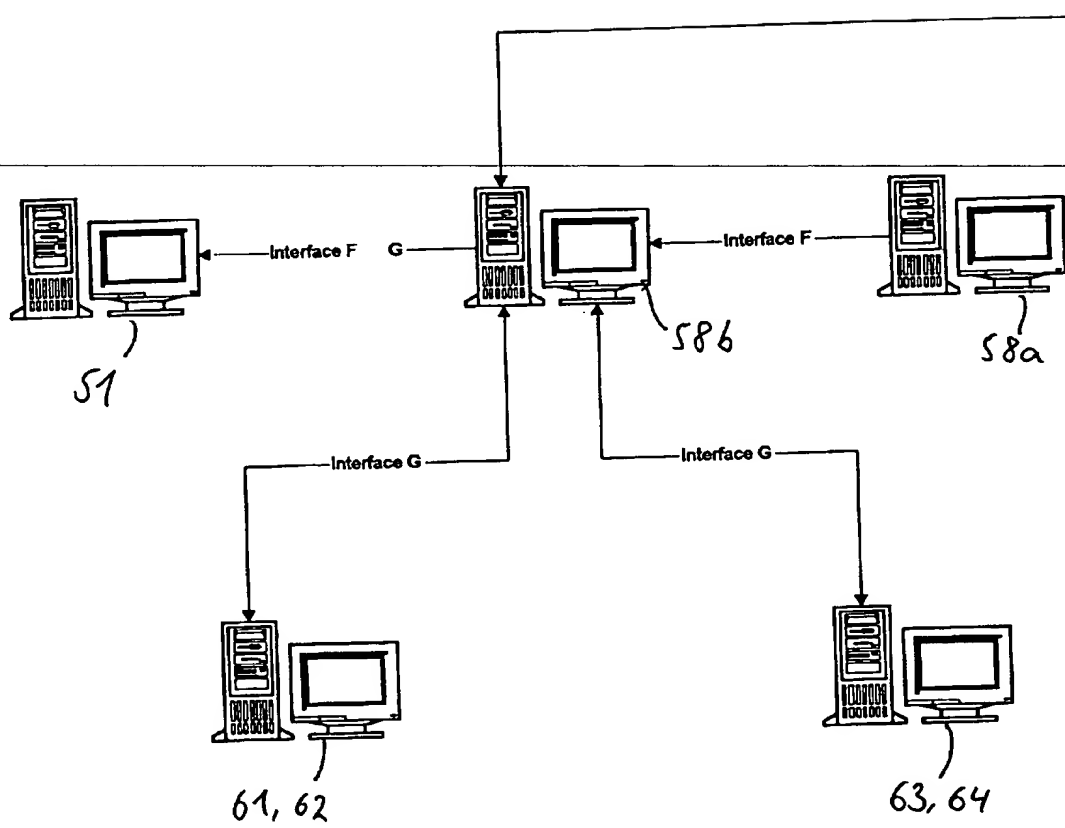


Fig. 6

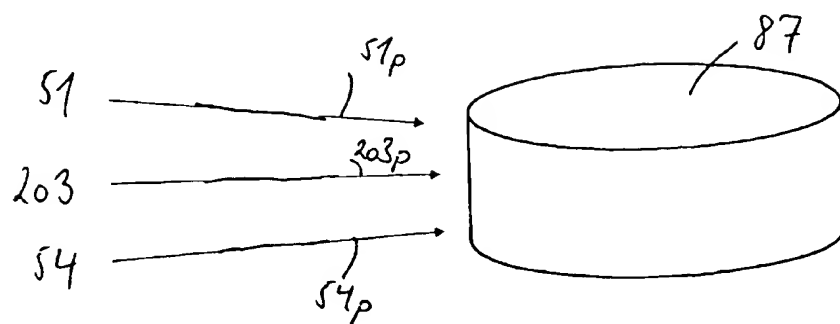


Fig. 7

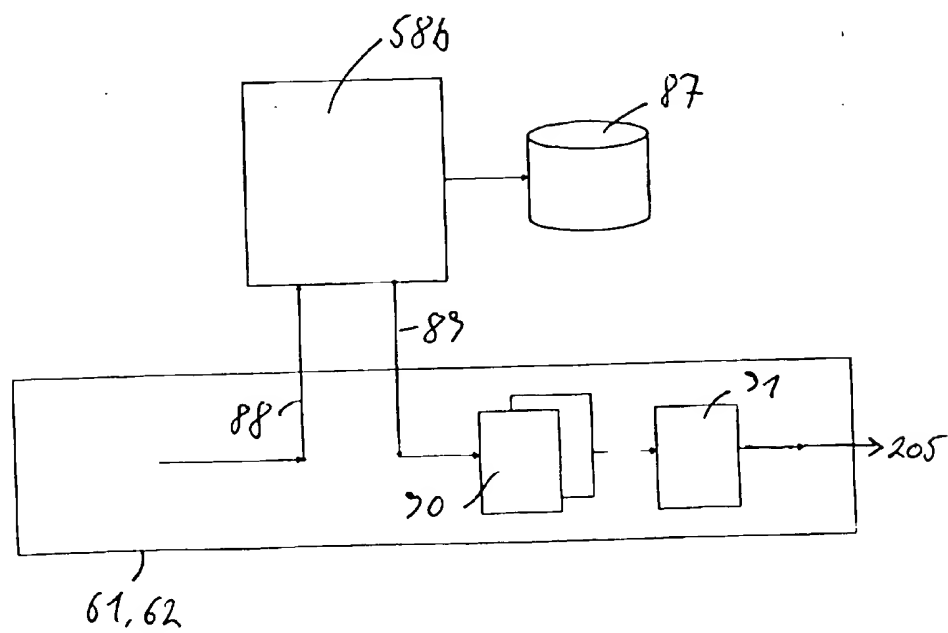


Fig. 8

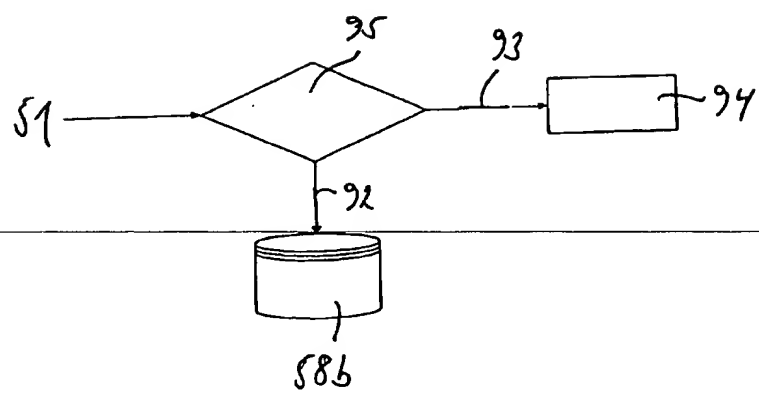


Fig. 9

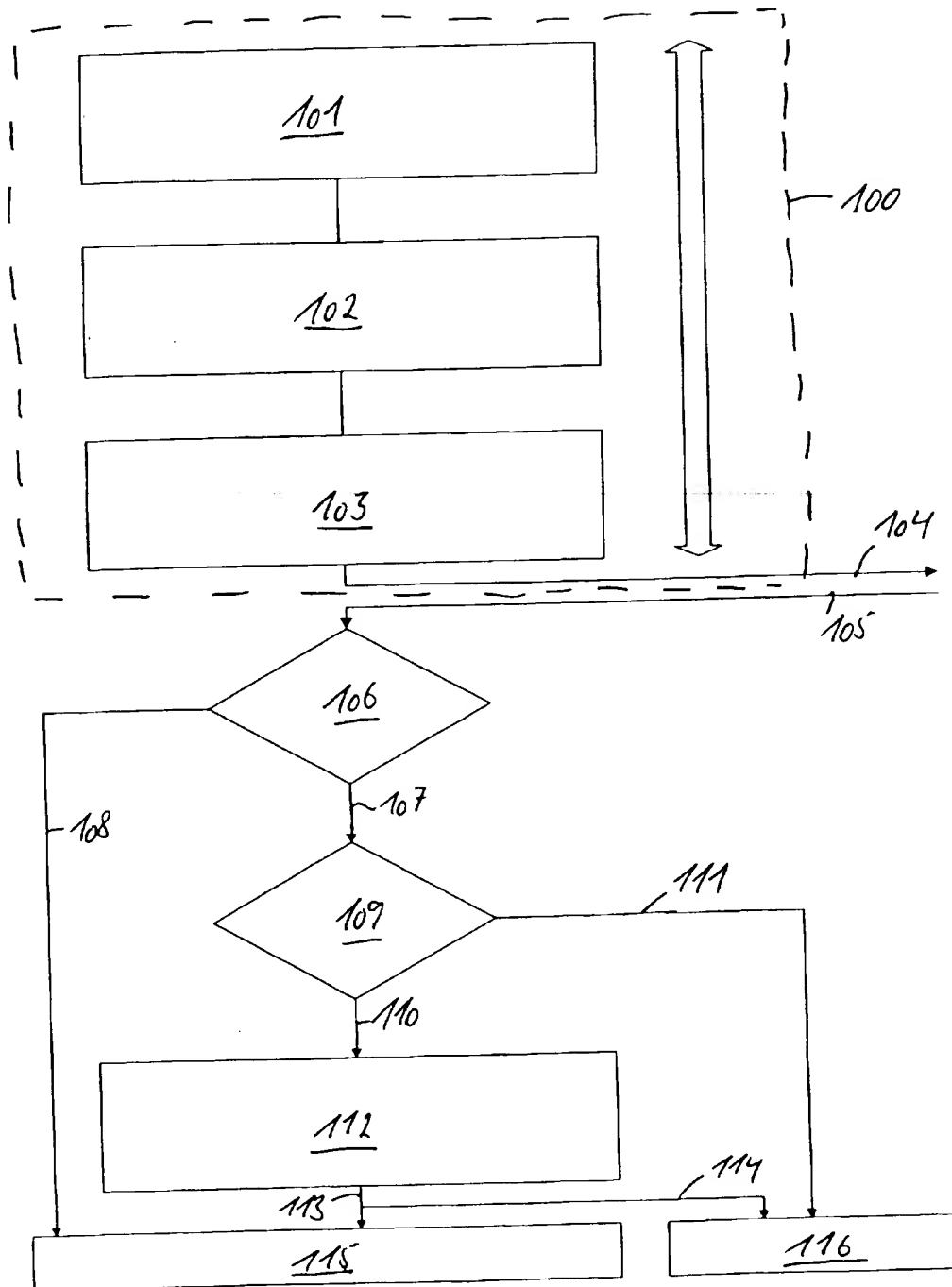


Fig. 10

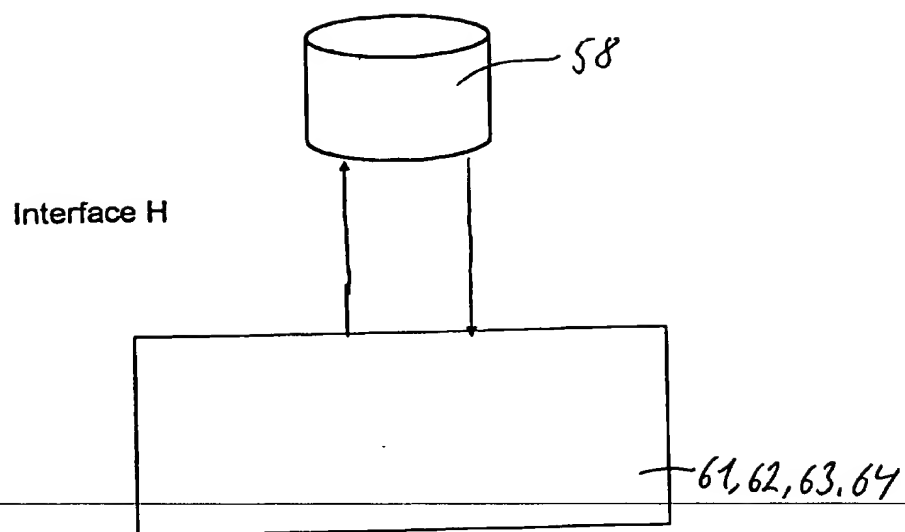


Fig. 11

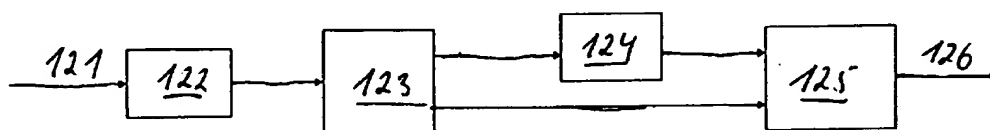


Fig. 12

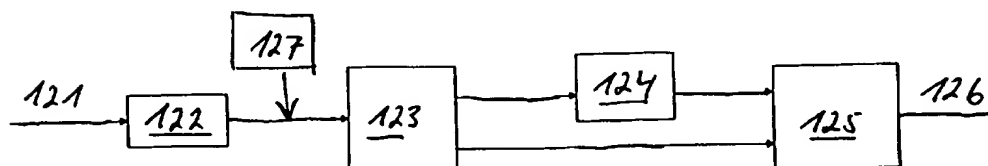


Fig. 13

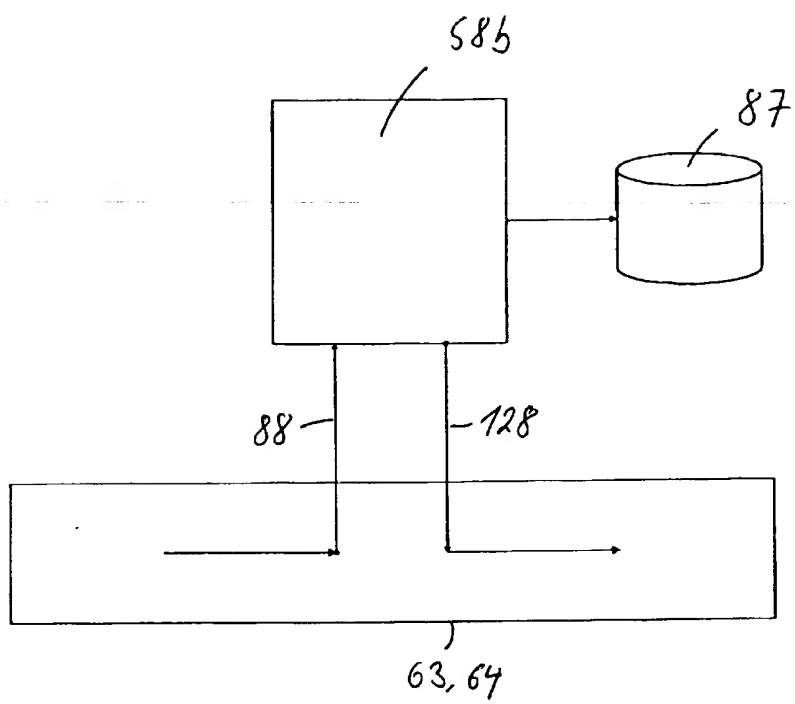


Fig. 14

